

# TARGETED FLOW MONITORING SUMMARY REPORT

## Introduction

The Red River Authority of Texas in conjunction with the Clean Rivers Program of the Texas Commission on Environmental Quality (TCEQ) conducted a flow study for the permitting process. This report summarizes the findings of the study.

## Purpose of the Monitoring

Stream discharge was monitored monthly in three unclassified streams from February 2004 through July 2005 to help characterize flow conditions for the permitting process.

**Table 1. Streams Monitored, Station Numbers, and Permit Numbers**

Stream	Station ID	Permit Number
Bois D' Arc Creek Near Bonham	15749	10070-001
Unnamed Tributary of Lake Texoma	18369	10079-005
South Groesbeck Creek at US 287	16000	01610-000 (001 – 003)

## Basics of Conducting the Study

Flow was measured at each site using a Marsh – M<sup>c</sup>Birney Flow Mate electronic flow meter. Stream discharge was then calculated consistent with the TCEQ Surface Water Quality Monitoring (SWQM) Procedures Manual Volume 1, December 2003. Photographs were taken at the point of flow measurement, upstream, downstream, and any other areas that convey pertinent information concerning the measurement site. In addition to stream discharge, field parameters were also collected. These included water temperature, specific conductance, pH, dissolved oxygen, lab turbidity, and *E. coli* bacteriological indicator species. However, no field parameters were collected when flow was not measured. All data will be submitted electronically for inclusion in the TCEQ TRACS database. Data have been summarized in the following tables.

## Site Descriptions – Photographs From Each Event Provided

Bois D' Arc Creek Near Bonham – This site is located in Fannin County within one half mile of the City of Bonham WWTP. The specific site is located near an abandoned and washed out bridge on what was once known as Seven Oaks Road. This area is now primarily agricultural with areas of wildlife habitats. Access to this site is greatly restricted due to the swamp like conditions and heavily wooded surroundings. A vehicle must be parked approximately 150+ yards away from the site and equipment hiked in by back pack. The usual stream bed is between 15 to 20 feet from the top of the confines of the banks. The incline of the banks are steep and sharp. This stream is primarily perennial.

Unnamed Tributary of Lake Texoma – This site is located in Grayson County two miles by road northeast of the Grayson County Airport. The area is dominated by ranching and rural homes. The site is a very narrow and shallow intermittent stream with gently sloping banks.

South Groesbeck Creek at US 287 – This site is located in Hardeman County five miles west of Quanah under a highway overpass structure. Ranching is the primary activity in this area along with an industrial discharger. The stream is perennial with gently sloping grassed lined banks.

**Table 2. Summary of Monthly Data from Bois D' Arc Creek Near Bonham**

Permit Number 10070-001, TCEQ Station ID Number 15749							
Date	Flow (cfs) 00061	Temp (°C) 00010	Specific Conductance (μS/cm) 00094	pH (SU) 00400	Dissolved Oxygen (mg/L) 00300	Lab Turbidity (NTU) 82079	<i>E. coli</i> (MPN/100) 31699
02/16/04	HIGH	—	—	—	—	—	—
03/16/04	52	12.1	436	8.2	10.3	23.2	1,046
04/20/04	6.8	20.1	522	7.9	7.3	5.5	52
05/17/04	1.9	21.8	557	7.9	7.4	13.3	184
06/14/04	LOW	—	—	—	—	—	—
07/13/04	—	—	—	—	—	—	—
07/23/04	0.16	28.1	512	8.3	5.4	10.8	47
08/16/04	0.0375	25.7	500	8.0	7.1	5.3	28
09/13/04	DRY	—	—	—	—	—	—
10/12/04	HIGH	—	—	—	—	—	—
11/22/04	HIGH	—	—	—	—	—	—
12/14/04	28	5.7	570	8.7	11.8	5.7	78
01/11/05	HIGH	—	—	—	—	—	—
02/14/05	HIGH	—	—	—	—	—	—
03/10/05	27	11.9	556	8.0	11.6	2.7	62
04/13/05	29	16.9	552	8.1	9.2	5.1	79
05/20/05	3.6	23.9	569	7.8	5.5	14.5	81
06/16/05	0.6	26.1	647	7.8	5.4	8.4	129
07/13/05	0.0	—	—	—	—	—	—

Flow measurement was not taken when HIGH due to unsafe conditions as noted in the SWQM Procedures Manual Volume 1. On 06/14/04 the flow was LOW by appearance. However, the water level was at the top of the banks due to heavy rainfall within the past week and a log jam/beaver dam downstream restricted flow. The excessive depth of the stream was cause for unsafe conditions. On 09/13/04 the specific flow site was DRY. However, broken pools were visible. On 07/13/04 the site was not accessible due to recent heavy rainfall, therefore authorization was received from TCEQ to reschedule the site visit for 07/23/04. On 07/13/05 water was present throughout the site, but no movement was detected. The flow was reported as 0.0 according to the SWQM Procedures Manual Volume 1.



Bois D'Arc Creek Near Bonham  
02-16-04



Bois D'Arc Creek Near Bonham  
03-16-04



Bois D'Arc Creek Near Bonham  
04-20-04



Bois D'Arc Creek Near Bonham  
05-17-04



Bois D'Arc Creek Near Bonham  
06-14-04



Bois D'Arc Creek Near Bonham  
07-13-04



Bois D'Arc Creek Near Bonham  
07-23-04



Bois D'Arc Creek Near Bonham  
08-16-04



Bois D'Arc Creek Near Bonham  
09-13-04



Bois D'Arc Creek Near Bonham  
10-12-04



Bois D'Arc Creek Near Bonham  
11-22-04



Bois D'Arc Creek Near Bonham  
12-14-04



Bois D'Arc Creek Near Bonham  
01-11-05



Bois D'Arc Creek Near Bonham  
02-14-05



Bois D'Arc Creek Near Bonham  
03-10-05



Bois D'Arc Creek Near Bonham  
04-13-05



Bois D'Arc Creek Near Bonham  
05-20-05



Bois D'Arc Creek Near Bonham  
06-16-05



Bois D'Arc Creek Near Bonham  
07-13-05

**Table 3. Summary of Monthly Data from Unnamed Tributary of Lake Texoma**

<b>Permit Number 10079-005, TCEQ Station ID Number 18369</b>							
<b>Date</b>	<b>Flow (cfs) 00061</b>	<b>Temp (°C) 00010</b>	<b>Specific Conductance (μS/cm) 00094</b>	<b>pH (SU) 00400</b>	<b>Dissolved Oxygen (mg/L) 00300</b>	<b>Lab Turbidity (NTU) 82079</b>	<b><i>E. coli</i> (MPN/100) 31699</b>
02/16/04	0.6	8.7	397	7.9	11.6	94.9	480
03/16/04	0.017	14.2	1,130	8.1	12.1	25.8	262
04/20/04	DRY	—	—	—	—	—	—
05/17/04	DRY	—	—	—	—	—	—
06/14/04	DRY	—	—	—	—	—	—
07/13/04	DRY	—	—	—	—	—	—
08/16/04	DRY	—	—	—	—	—	—
09/13/04	DRY	—	—	—	—	—	—
10/12/04	0.0	—	—	—	—	—	—
11/22/04	0.0	—	—	—	—	—	—
12/14/04	0.01	5.0	1,120	8.3	13.1	14.5	59
01/12/05	0.2	15.8	1,200	8.0	9.6	11.5	687
02/14/05	0.0846	15.4	1,200	8.1	11.3	7.6	74
03/10/05	0.06	16.8	1,470	8.2	10.9	31.4	2,419
04/13/05	0.025	12.3	1,220	7.8	8.9	24.8	770
05/20/05	DRY	—	—	—	—	—	—
06/16/05	DRY	—	—	—	—	—	—
07/13/05	DRY	—	—	—	—	—	—

No water was present during DRY conditions. Flow values of 0.0 indicate that water was present. However, no flow was detected and/or isolated pools were visible. Refer to SWQM Procedures Manual Volume 1.



Unnamed Tributary to Lake Texoma  
02-16-04



Unnamed Tributary to Lake Texoma  
03-16-04



Unnamed Tributary to Lake Texoma  
04-20-04



Unnamed Tributary to Lake Texoma  
05-17-04



Unnamed Tributary to Lake Texoma  
06-14-04



Unnamed Tributary to Lake Texoma  
07-13-04



Unnamed Tributary to Lake Texoma  
08-16-04



Unnamed Tributary to Lake Texoma  
09-13-04



Unnamed Tributary to Lake Texoma  
10-13-04



Unnamed Tributary to Lake Texoma  
11-22-04



Unnamed Tributary to Lake Texoma  
12-14-04



Unnamed Tributary to Lake Texoma  
01-25-05



Unnamed Tributary to Lake Texoma  
02-14-05



Unnamed Tributary to Lake Texoma  
03-10-05



Unnamed Tributary to Lake Texoma  
04-13-05



Unnamed Tributary to Lake Texoma  
05-20-05



Unnamed Tributary to Lake Texoma  
06-16-05



Unnamed Tributary to Lake Texoma  
07-13-05

**Table 4. Summary of Monthly Data from South Groesbeck Creek at US 287**

<b>Permit Number 01610-000 (001-003), TCEQ Station ID Number 16000</b>							
<b>Date</b>	<b>Flow (cfs) 00061</b>	<b>Temp (°C) 00010</b>	<b>Specific Conductance (μS/cm) 00094</b>	<b>pH (SU) 00400</b>	<b>Dissolved Oxygen (mg/L) 00300</b>	<b>Lab Turbidity (NTU) 82079</b>	<b><i>E. coli</i> (MPN/100) 31699</b>
02/17/04	2.7	9.8	6,210	7.7	13.3	10.4	384
03/18/04	3.6	20.6	6,100	7.6	10.7	73.2	638
04/19/04	3.3	20.1	6,080	7.6	8.4	35.0	71
05/18/04	3.2	24.1	6,025	7.6	9.0	41.4	226
06/17/04	2.6	27.8	6,000	7.6	9.8	33.7	121
07/12/04	2.5	26.1	6,220	7.5	9.4	31.5	374
08/17/04	2.3	22.6	6,500	7.6	10.3	25.2	41
09/07/04	2.4	20.8	6,400	7.8	7.3	31.3	143
10/11/04	2.4	18.6	6,300	7.6	8.1	17.0	350
11/17/04	Flood	—	—	—	—	—	—
12/07/04	2.8	10.5	6,140	7.6	7.7	25.5	359
01/10/05	3.1	12.3	6,020	7.5	9.7	27.5	160
02/15/05	3.0	15.5	6,200	7.7	13.0	7.1	496
03/14/05	2.9	14.7	6,300	7.8	12.4	6.1	295
04/11/05	3.0	17.0	6,050	7.8	12.1	7.8	160
05/18/05	3.0	23.3	6,000	7.6	8.4	127.0	228
06/20/05	2.7	30.0	6,000	7.7	12.4	5.8	134
07/11/05	3.4	27.0	4,500	7.4	6.3	68.7	225

No flow measurement was taken 11/17/04 as Flood conditions were cause for unsafe circumstances. Refer to SWQM Procedures Manual Volume 1.



South Groesbeck Creek at US 287  
02-17-04



South Groesbeck Creek at US 287  
03-18-04



South Groesbeck Creek at US 287  
04-19-04



South Groesbeck Creek at US 287  
05-18-04



South Groesbeck Creek at US 287  
06-17-04



South Groesbeck Creek at US 287  
07-12-04



South Groesbeck Creek at US 287  
08-17-04



South Groesbeck Creek at US 287  
09-07-04



South Groesbeck Creek at US 287  
10-11-04



South Groesbeck Creek at US 287  
11-17-04



South Groesbeck Creek at US 287  
12-07-04



South Groesbeck Creek at US 287  
01-10-05



South Groesbeck Creek at US 287  
02-15-05



South Groesbeck Creek at US 287  
03-14-05



South Groesbeck Creek at US 287  
04-11-05



South Groesbeck Creek at US 287  
05-18-05



South Groesbeck Creek at US 287  
06-20-05



South Groesbeck Creek at US 287  
07-11-05